Fermilab

Fermi National Accelerator Laboratory

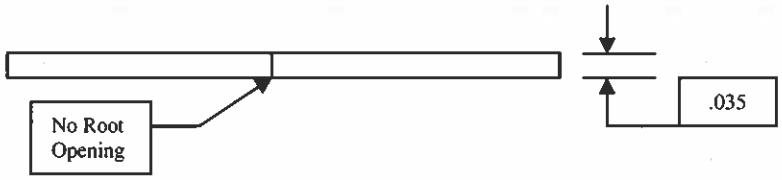
Technical Division-Machine Shop

Welding Procedure Specification

Welding Procedure Specification No.: *Fermi WPS SS-8-001*			**Date:** *12/7/2009*
Revision No.:1	Revision Date:11/27/09	Remarks: Revised Amperage & Voltage	**Supporting PQR No.(s):** *Fermi PQR SS-8-0001*
Welding Processes:	(1)Type: GTAW/Manual	(2)Type:	
(Manual, Automatic, Machine, Semi-automatic)			

Joints (QW-402):			
Joint Design: *Square Butt Groove*	**Backing:** *Gas*	**Backing Material (Type) Root:** *Argon Gas*	**Remainder:** *None*
~~**Retainer:** Yes *** No~~	~~**Type:** Non-Metallic *** Metallic (Non-fusing)~~		

Joint Details: *Square Butt Groove*



Base Metals (QW403):	P-No.: *8, Group 1*	To	P-No.: *8, Group 1*
Specification Type and Grade: *SA 240 Type 304*			
TO Specification Type and Grade: *SA 240 Type 304*			
OR Chemical Analysis and Mechanical Properties:			
TO Chemical Analysis and Mechanical properties:			

Thickness Range:	**Process 1**		**Process 2**	
Base Metal:	Groove: *.032"-.064"*	Fillet: *Unlimited*	Groove:	Fillet:
Deposited Weld Metal:	Groove: *.032"-.064"*	Fillet: *Unlimited*	Groove:	Fillet:
Pipe Diameter Range:	Groove: *2.875" Minimum*	Fillet: *Unlimited*	Groove:	Fillet:
Other:				

Filler Metals (QW-404)	Process 1		Process 2	
Specification No. (SFA):	*5.9*			
AWS No, (Class):	*308/308L*			
F-No.:	*F6*			
A No.:	*8*			
Size of Filler Metals:	*.035", 045"Ø*			
Deposited Weld Metal Thickness Range:	Groove: *.032"-.064"*	Fillet: *Unlimited*	Groove:	Fillet:
Electrode-Flux (Class):				
Flux Trade Name:				
Consumable Insert:				
Other:				

Each Base Metal-Filler Metal Combination should be recorded individually

Use of Fermilab Welding Procedures and Welder Qualifications for non-Fermilab work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save Fermilab and the government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees possession and use of Fermilab procedures and qualifications.

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Positions (QW-405		**Post Heat Treatment (QW-407)**	
Positions of Groove:	*1 G*	Temperature Range:	*None*
Welding Progression	*Flat*	Time Range	*N/A*
Positions of Fillet	*All*		

Preheat (QW-408)		**Gas (QW-408)**			
Preheat Temperature:	*Minimum 50°F*			% Composition	
Interpass Temperature:	*Maximum-Not Recorded*		Gases	Mixture	Flow Rate
Preheat Maintenance:	*None*	Shielding	*Argon*	*99.9%*	*15-20 CFH*
Minimum Welding Temperature	*32°F*	Trailing	*None*	***	***
		Backing	*Argon*	*99.9%*	*15-20 CFH*

Electrical Characteristics (QW-409)					
Current – AC or DC:	Direct Current	Polarity:	Straight	Characteristics	Non-Pulsing
Tungsten Electrode:	Size: *.0625" Ø - 3/32" Ø*		*EWTh-2*		
Mode of Metal Transfer for GMAW:	N/A				
Electrode Wire Feed Speed Range:	N/A				

Technique (QW-410)	
String or Weave Bead:	String
Orifice or Gas Cup Size:	#5 or #7 Gas Lens
Initial Interpass Cleaning (Brushing, Grinding, etc.):	Initial Solvent Clean
Method of Back Gouging:	None
Oscillation: None	
Contact Tube to Work Distance:	N/A
Multiple or Single Pass (per side):	Single
Multiple or Single Electrode(s):	Single
Travel Speed (Range):	As Required
Peening:	None
Other:	

Sequence Chart:

Weld Layers	Processes	Filler Metal		Current		Voltage Range	Travel Speed Range	Other (Power Source) (Special Requirement)
		Class	Ø	Type Polarity	Amperage Range			
1 Final	*GTAW*	*308/308L*	*0.035Ø*	*DCEN*	*40-48*	*8-14*	*As Required*	*Use clamping fixture with back purge capability* *Miller Syncrowave 300 With remote foot pedal control*

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